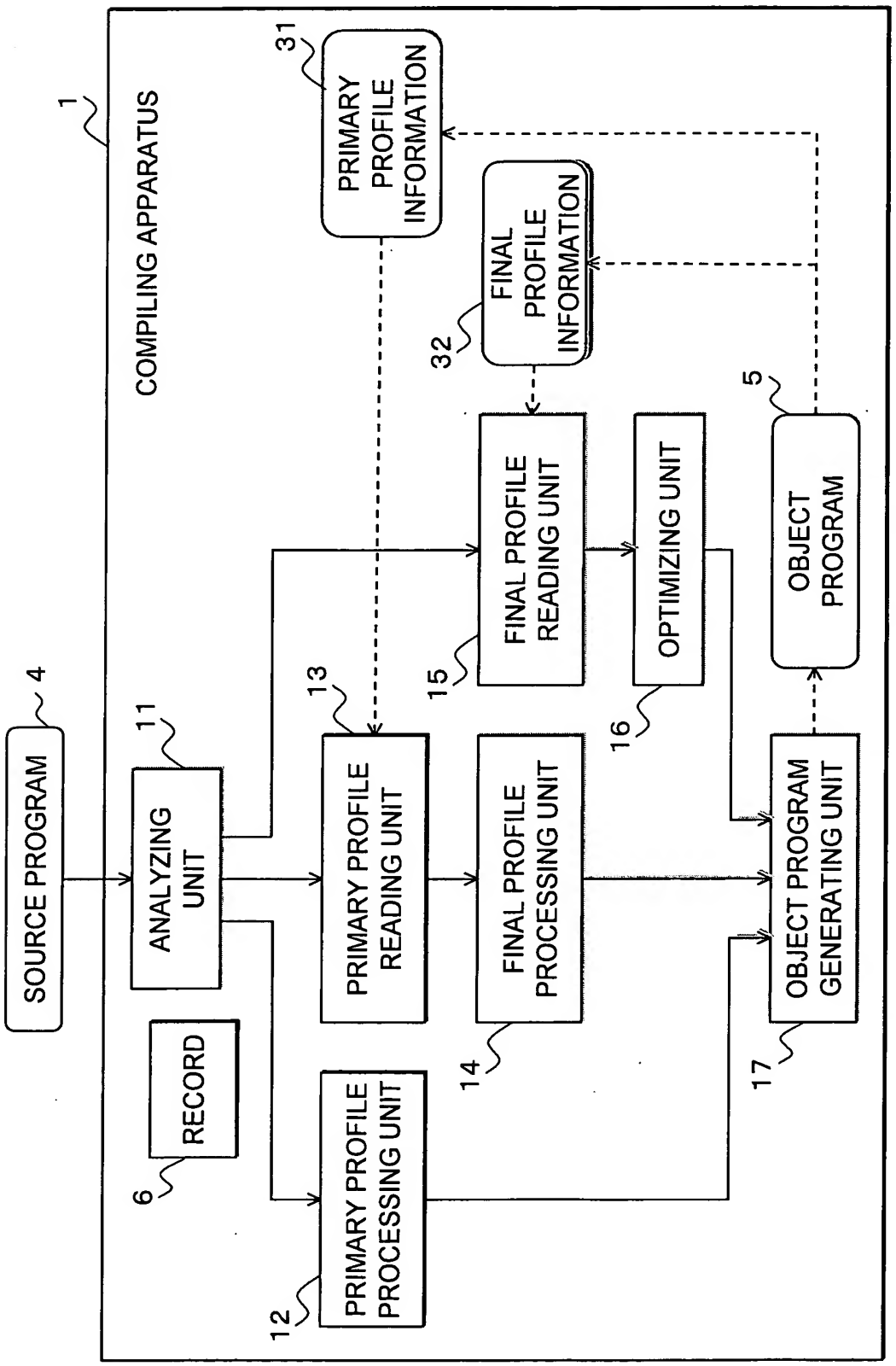
1
COMPILING APPARATUS
SOURCE PROGRAM
4
ANALYZING UNIT
11
RECORD
6
PRIMARY PROFILE READING UNIT
13
PRIMARY PROFILE PROCESSING UNIT
12
FINAL PROFILE READING UNIT
15
FINAL PROFILE PROCESSING UNIT
14
OPTIMIZING UNIT
16
OBJECT PROGRAM GENERATING UNIT
17
OBJECT PROGRAM
5
PRIMARY PROFILE INFORMATION
31
FINAL PROFILE INFORMATION
32

FIG.1

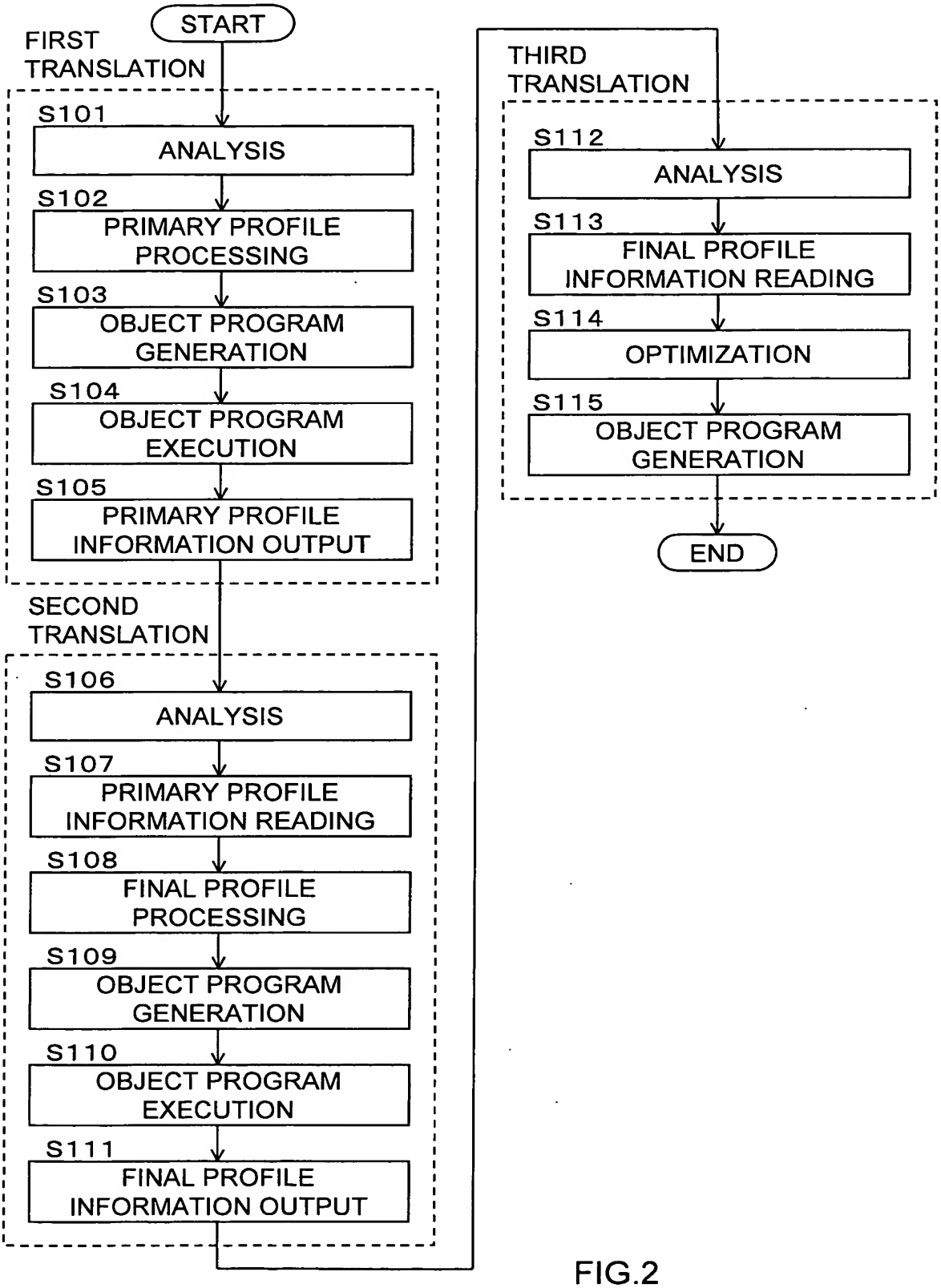
START
FIRST TRANSLATION
S101
ANALYSIS
S102
PRIMARY PROFILE PROCESSING
S103
OBJECT PROGRAM GENERATION
S104
OBJECT PROGRAM EXECUTION
S105
PRIMARY PROFILE INFORMATION OUTPUT
SECOND TRANSLATION
S106
ANALYSIS
S107
PRIMARY PROFILE INFORMATION READING
S108
FINAL PROFILE PROCESSING
S109
OBJECT PROGRAM GENERATION
S110
OBJECT PROGRAM EXECUTION
S111
FINAL PROFILE INFORMATION OUTPUT
THIRD TRANSLATION
S112
ANALYSIS
S113
FINAL PROFILE INFORMATION READING
S114
OPTIMIZATION
S115
OBJECT PROGRAM GENERATION
END

FIG.2

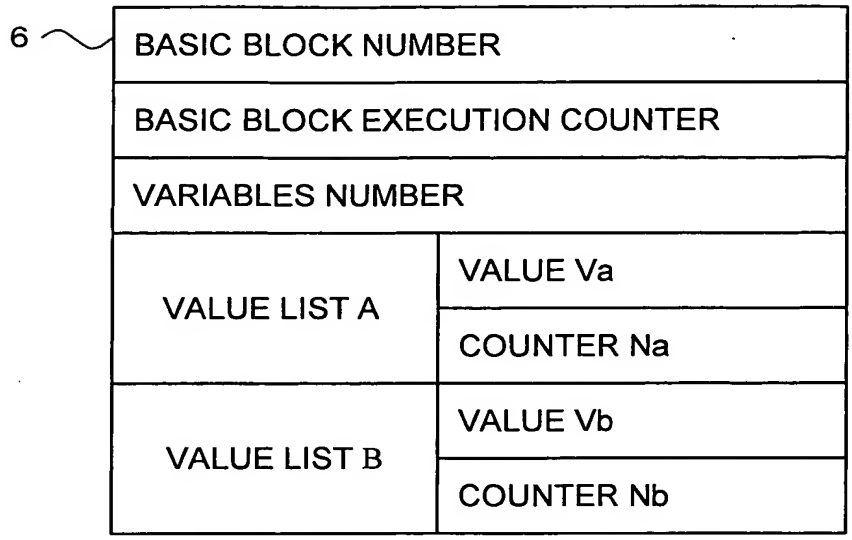

FIG.3A

```
struct prof_record {
   int bb_id;          /* UNIQUE NUMBER ASSIGNED BY
                          COMPILER TO BASIC BLOCK */
   int bb_count;       /* COUNTER OF BASIC BLOCK EXECUTIONS */
   int var_id;         /* UNIQUE NUMBER ASSIGNED BY COMPILER
                          TO VARIABLE */
   struct {            /* VALUE LIST */
      int val;         /* VALUE ASSIGNED TO VARIABLE UPON
                          EXECUTION */
      int count;       /* NUMBER OF TIMES VALUE IS GIVEN */
   } array [2]         /* NUMBEROF VALUE LIST IS 2 */
}
```

FIG.3B

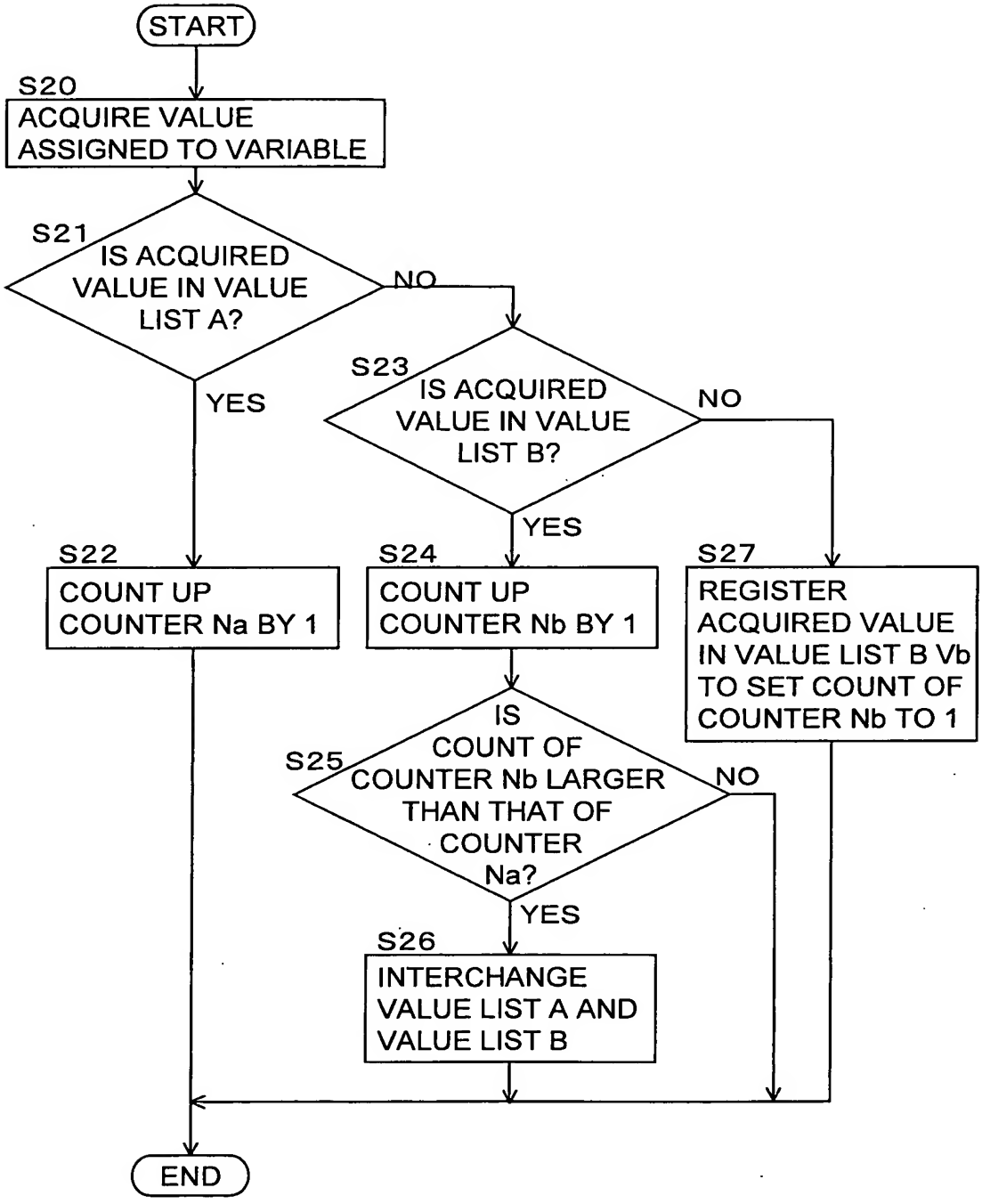
START
S20
ACQUIRE VALUE ASSIGNED TO VARIABLE
S21
IS ACQUIRED VALUE IN VALUE LIST A?
NO
YES
S23
IS ACQUIRED VALUE IN VALUE LIST B?
NO
YES
S22
COUNT UP COUNTER Na BY 1
S24
COUNT UP COUNTER Nb BY 1
S27
REGISTER ACQUIRED VALUE IN VALUE LIST B Vb TO SET COUNT OF COUNTER Nb TO 1
S25
IS COUNT OF COUNTER Nb LARGER THAN THAT OF COUNTER Na?
NO
YES
S26
INTERCHANGE VALUE LIST A AND VALUE LIST B
END

FIG.4

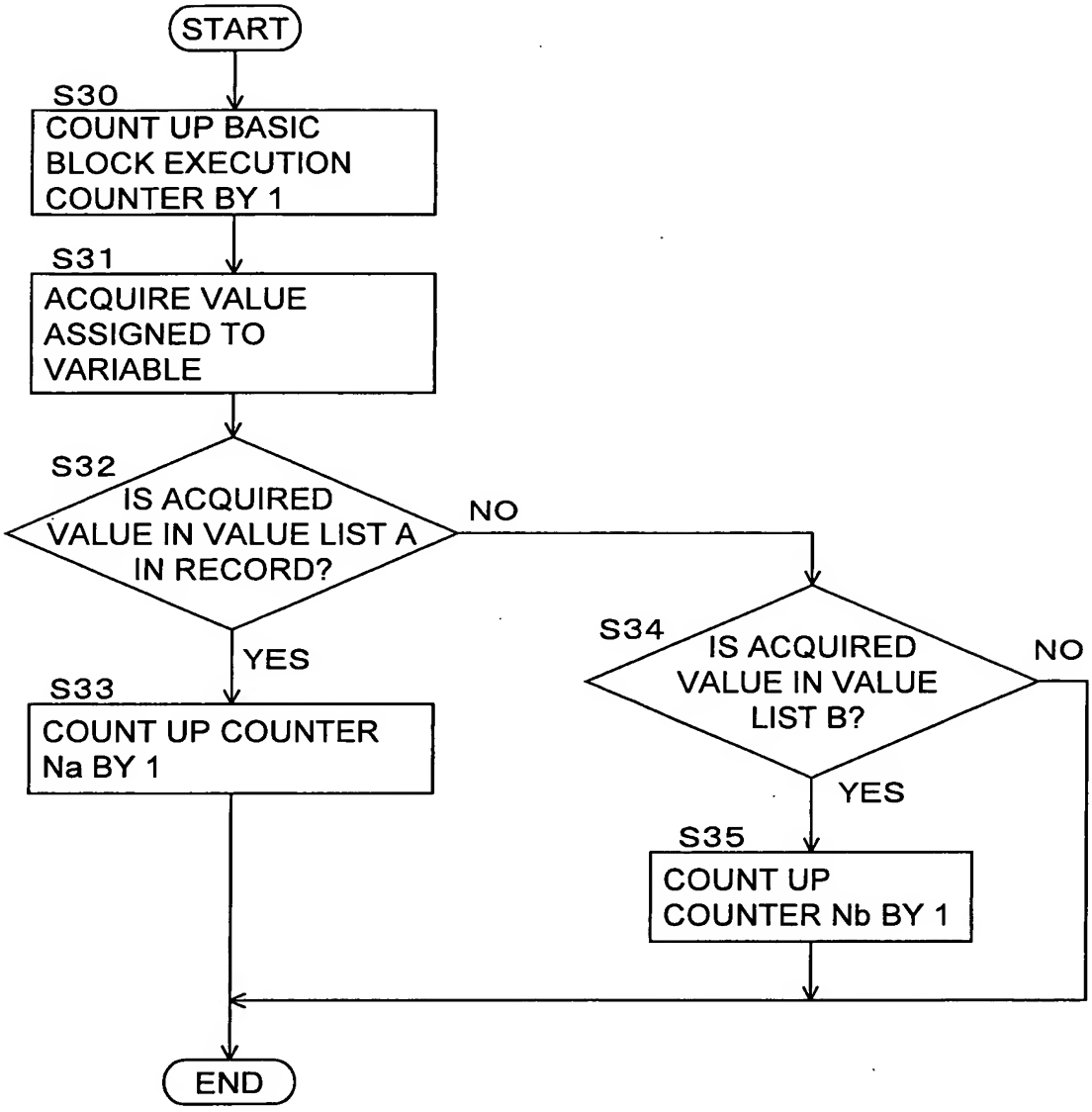
START
S30
COUNT UP BASIC BLOCK EXECUTION COUNTER BY 1
S31
ACQUIRE VALUE ASSIGNED TO VARIABLE
S32
IS ACQUIRED VALUE IN VALUE LIST A IN RECORD?
NO
YES
S33
COUNT UP COUNTER Na BY 1
S34
IS ACQUIRED VALUE IN VALUE LIST B?
NO
YES
S35
COUNT UP COUNTER Nb BY 1
END

FIG.5

BEFORE OPTIMIZATION

```
short foo (short x, short y)
{
      short d;

      d = x / y;
      return d;
}
```

FIG.6A

AFTER OPTIMIZATION

```
short foo (short x, short y)
{
      short d;

      if (y == 17) {
            return ((int)x * 3855) >> 16;
      } else {
            d = x / y;
            return d;
      }
}
```

FIG.6B